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A NEW CANADIAN *STRYMON* (LYCAENIDAE, LEPIDOPTERA) *

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The *Strymon* species now called *falacer* Godt., but until recently better known as *calanus* Hbn. was the subject, in the days of Scudder and Grote, of much controversy. It is not my intention at the present time to enter into the details of this discussion and the names involved; suffice to say that, after a careful study of the literature, I am of the opinion that the present synonym, as given in the 1937 Check List, is correct. The species has been figured on various occasions, but probably the most reliable figure is that given by Austin Clark (Butterflies of the District of Columbia and Vicinity, Pl. XXIV, Fig. 7, 8).

Scudder in his butterflies of the Eastern United States gives the larval food plants as oak and hickory and this statement has apparently been accepted by all later workers. In the spring of 1941 I secured a few *Strymon* larvae, while collecting in the vicinity of Ottawa, from each of these trees; owing to pressure of other work no detailed larval studies were made, but it was noted that the hickory feeders were more evenly pale green without much trace of darker dorsal and lateral markings. In due course two typical *falacer* females and one *strigosa* female emerged from the oak feeders; a week or two later three males and three females emerged from the hickory larvae. On a careful examination of this latter series certain constant differences were noted in the maculation of the underside which led to a suspicion that the species was distinct from *falacer;* a study of the male genitalia confirmed this suspicion. As no name appears to be available for the species I describe it as follows:

Strymon caryaevorus n. sp.

Upper side in both sexes a deep black-brown, very similar to that of *falacer,* showing no trace of an orange spot at anal angle of secondaries as is found in *edwardsii* or *strigosa.* Male stigma rather more narrowly oval and tails of hindwings slightly shorter than in *falacer.* Under side of primaries with essentially the same type of maculation as *falacer,* but the postmedian band of rectangular spots is more irregular, somewhat broader and much better defined on the inner side, as well as the outer side, by white edging, a feature that applies also to the spots on the secondaries. The most distinctive feature is found in the first (subcostal) spot in the posmedian band of the secondaries which is very broad and almost directly above the discocellular patch, in this respect showing more similarity to *strigosa* than to *falacer.* The rest of the maculation much as in *falacer,* but the red edging to the black marginal lunule between the tails of the secondaries somewhat less prominent. The male genitalia show a finger-like projection at the base of the tegumen, lacking in *falacer,* but very similar to that found in *strigosa.*

Holotype—♂, Merivale, Ont., June 12, 1941, (J. McDunnough); bred from *Carya* sp. No. 5262 in the Canadian National Collection.

Allotype—♀, same data, June 9.

Paratypes—2 ♂, 2 ♀, same data, June 9, 12; 1 ♂, 1 ♀, Aylmer, Que., June 12, 1919, (larva on hickory).

*Contribution No. 2121, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

A NEW RACE OF *COENONYMPHA AMPELOS* FROM THE MONO BASIN OF CALIFORNIA (LEPIDOPTERA, RHOPALOCERA)

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For a number of years the fact has been known that colonies of a *Coenonympha* related to *ampelos* Edw. inhabit the Mono Basin of California, along the eastern base of the Sierra Nevada. Although the members of these colonies, which are alike, possess characteristics that distinguish them readily from *ampelos* or any other race of *Coenonympha,* this fact has somehow escaped the attention of entomologists. Comstock mentions this Mono Basin race in *The Butterflies of California,* the text of which refers to the Mono Basin colonies as *Coenonympha ampelos* Edw., but the specimens figured (Pl. 18, Fig. 9 and 10) are unlike the Mono Basin race and are, in fact, from Wallace, Idaho. After considering some of this writer's cursory notes, Doctor Comstock wrote me on September 30, 1939, "I think your conclusions regarding the validity of the Mono Basin race would stand if the description were properly drawn up." Upon very rare occasions an insect similar to *ampelos* or *elko* is present in the Mono Basin, but the vast majority are constant. Any colony of insects having recognizable and distinct characteristics deserves at least racial distinction if the large majority are constantly similar.

The smaller specimen is an example of *ampelos* from Salem, Oregon; the larger specimen is *mono* nov.

It might be illuminating to preface this description by here repeating Edwards' brief description of *Coenonympha ampelos*:

"Male—Expands 1.3 inch. Upper side bright, glossy ochraceous; immaculate; fringes concolored.

"Under side nearly same shade, paler changing to buff at apex of primaries; on secondaries slightly paler at outer angle and elsewhere much powdered with brown atoms, a pale straight ray from the costal edge of the primaries nearly crosses the wing; secondaries have a similar ray, tortuous, interrupted in the upper median interspaces, not quite reaching the abdominal margin; both wings immaculate.

"Body fuscous covered with ochraceous hairs: beneath yellowish and grey; palpi grey; antennae annulated black and white: club black, tip ferruginous.

"Female—Same size, slightly paler; otherwise like male.

"From 1 ♂, 1 ♀, Oregon. Allied to *inornata,* Edw."

For this race from the Mono Basin, I propose the name

Coenonympha ampelos mono race nov.

Male. Expanse 1.25 inches. It is consistantly an eighth of an inch greater in expanse than is *ampelos.* Although Edwards gives the expanse of *ampelos* as 1.3 inches, a series in excess of twenty-five specimens from western Oregon

(many from Salem) captured over a period of several years reveals not a single specimen to exceed an expanse of 1.13 inches. In contrast to these, a series of twenty-two unselected specimens of *mono* demonstrates no individual to be under 1.25 inches. *Mono* is notably brighter and of clearer ochre than is *ampelos*.

Primaries, under side. The pale straight ray from the costal edge that nearly crosses the wing of *ampelos* is in *mono* much more pronounced, being a broad bar extending normally no more than half way across the wing, frequently less than that.

Secondaries, under side. While *ampelos* reveals the outer angle to be slightly paler than the remainder of the wing, this cannot be considered as a character of *mono* as more often no change of color is here perceptible. The composite ground color of *ampelos* is exceedingly variable, ranging from the effect of ochre to that of sooty brown, while this composite coloration in *mono* has the effect of a yellowish taupe, almost no variation from this being present. The tortuous ray is much more prominent and extended than in *ampelos*, and it forms an acute rectangle or "V" where it is interrupted in the median interspaces. While this ray is simulated in some other races of *Coenonympha*, it is comparatively suppressed in *ampelos*. The lower arm of the "V" is about half the length of the ray above the angle. *Mono* may always be distinguished by the two pale spots across the basal area, one about the center of this region, and a larger one between it and the costa. Frequently the lesser spot is connected to the lower arm of the "V" by a thin, pale line. These maculations accomplish a complete change of pattern. The abortive continuation of the ray, near the abdominal margin, also has assumed a different shape, having taken the form of a miniature "V" often somewhat degenerate. Some light shadings (sometimes indistinct spots) often occur submarginally in the interspaces, however this can hardly be considered as an attribute, as this character is too variable and it is sometimes present to a minor degree in *ampelos*. Occasionally very small apical ocelli are present on the under side, usually being no more than a light dot; normally they are absent.

Female. Similar to the male, sometimes a shade lighter.

In other respects *mono* and *ampelos* are substantially alike. *Mono* unlike *ampelos* is single brooded.

Holotype– ♂, Bridgeport, Mono Co., California, 7–6–34, No. 5223 in the Canadian National Collection, Ottawa.

Allotype– ♀, Same location and date, in the Canadian National Collection.

Paratypes–1 ♂, Mono Lake, Mono Co., California, 6–13–35, 1 ♀, Bridgeport, Mono Co., California, 7–6–34, in the U. S. National Muesum. 23 paratypes, same locations and dates, in the collection of the author. Specimens will be distributed to other prominent museums.

THE COAST TICK (*IXODES CALIFORNICUS* BANKS) PROBLEM IN BRITISH COLUMBIA*

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During recent years the tick, *Ixodes californicus* Banks, has attained considerable prominence as a pest of man, pets and livestock in British Columbia coastlands. This progression from a parasite of relatively little importance to

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one of major economic significance has been brought about not only by the gradual spread of human settlement into the habitat of the tick, but also by a resulting marked increase in the population of the pest. The present economic status of this tick, as observed by officers of the Dominion Entomological Laboratory at Kamloops during the past eight years, is presented herewith.

Known also as the castor bean tick, because of its similarity to the Euorpean tick of that name (*Ixodes ricinus* Linn.), *I. californicus* was described by Banks in 1904 from specimens taken in California. Its distribution extends northward from California along the Pacific wet belt through Oregon and Washington into British Columbia. The most northerly record in this province is that of a female specimen taken at Ocean Falls (latitude 52° 35′). It was taken in large numbers during 1940 and 1941 as far inland as Chapmans, 130 miles up the Fraser River from Vancouver.

Although the tick appears to be distributed over most of the southern British Columbian coastal region, including Vancouver Island, it is exceptionally abundant in only very specific areas, and even in a given locality it exhibits a marked microgeographical distribution. Districts known at this laboratory to be particularly infested are Malahat, West Vancouver, Harrison Bay and Cultus Lake. In each of these places the ticks are confined largely to very definite regions. In the case of West Vancouver, they are a pest only west and north of West Bay. The adjoining district of North Vancouver has experienced no trouble with them whatsoever. At Harrison Bay the ticks are abundant only at the bases of steep banks alongside the highway. A few feet up these slopes, or on the opposite side of the road, they are almost entirely absent. During recent years the tick population has been particularly high in the vicinity of resorts and other rural centers. Many communities have complained of this increase in the numbers of ticks, such complaints having been received from Caulfield, Gleneagles, Horseshoe Bay, Cultus Lake, Yale and Alexandra Lodge.

The life-cycle of *I. californicus*, like that of most ixodid ticks, involves a separate host for each of its three stages. The larval and nymphal instars feed readily on lizards (*Gerrhonotus principis* Baird and Girard) and judging from field observations, this reptile appears to be the main host for these stages of the tick. The parasites are usually attached in the lateral cervical pouches of the lizards, though occasionally they may be found along the lateral fold and about the axillary folds. The maximum infestation on record is 103 ticks from one lizard. Although large numbers of other animals have been examined in tick infested areas, only on a few occasions have they been found to harbour the immature stages of this tick. These positive records include larvae and nymphs from squirrels, white-footed mice and grouse. Jellison (1) with reference to studies of this tick in California has also commented upon the tick-lizard relationship and states that "the considerable population of lizards and the number of ticks present on them suggest to the author that they are important hosts of the immature stages of the tick concerned." So far as is known the final or adult stage of the tick attacks only larger animals, and it is a common parasite on dogs, cats, deer, man, goats and cattle. The ticks are picked up by any of these hosts from the low vegetation and, once on their victims, proceed to attach to the skin. During the feeding period, which averages a week, the females swell to many times their original size, then drop to the ground, and after a few weeks begin to lay eggs which may number up to several thousands.

Where the tick is plentifully distributed in farming districts, it has proven itself capable of being a serious pest to cattle. Laboratory and field observations show that it is also a potential pest of goats and sheep, upon which animals the tick feeds readily. The chief importance of this tick, however, arises from the fact that, with the gradual influx of stray and pet dogs and cats into tick infested

regions, ideal conditions are being established for its perpetuation and increase in numbers. This is being demonstrated in the rapidly growing residential centre of West Vancouver, where ticks were already plentiful but are definitely multiplying with the corresponding increase in the numbers of domestic pets. The great majority of inhabitants there own cats or dogs, and although many conscientious owners daily make a careful search of their pets for ticks, others neglect this time-consuming task. Also there are large numbers of stray animals which are never inspected, and these must play a still greater part as tick hosts. Such comments from residents as "cat removes them himself", "dropped off normally", "full body ticks on dog", " tick dropped before my eyes" would indicate that thousands of larval ticks probably hatch in the immediate vicinity of many homes. Lizards, to nourish these early stages, are abundant and are to be found in the gardens and underbrush about any dwelling during practically all seasons of the year.

As a consequence, during recent years, ticks have been found to be particularly plentiful along many of the suburban rocky and woodland paths. Although present all-year-round, they are more numerous during the wet winter months and reach maximum activity during the spring season. At this time some residents "remove as many as twenty to twenty-five ticks daily from each dog", and while walking, pick them off their clothes "two and three at a time".

Both male and female ticks attach themselves to their hosts, though the male feeds but briefly and causes only a temporary irritating rash at the site of the bite. The wound inflicted by the female is more painful and, even if the tick is removed within a few minutes after it has attached, a severe toxaemia may occur. The latter may take the form of an extended swelling that often lasts for several days, or may lead to a slow-healing ulcer, persisting in exceptional cases as long as eighteen months. To date there has been found no satisfactory and reliable method of causing an attached tick to release its hold. Such measures, as the application of turpentine, iodine or a hot needle to the tick, as a rule kill the tick while it is still attached to the skin. The much used procedure of "unscrewing" the tick does, through its twisting effect, tend to loosen the barbed mouthparts, and the tick may occasionally be removed by this means without having to be excised.

Fortunately this species of tick has not, as yet, been incriminated in the transmission of any disease in British Columbia. However, specimens naturally infected with tularaemia have been collected in southwestern Oregon, and Parker (2) states, with reference to this instance, that the tick must certainly be a potential agent in human infection and likely an actual one. The closely related species, *I. ricinus* of Europe, is, moreover, a vector of several sporozoan and virus diseases, as well as being a causative agent of tick paralysis. Because of the potential danger from *I. californicus* as a disease carrier, and because there is every indication that, under the existing circumstances in British Columbia, this tick will continue to be an increasing source of annoyance to man, particular attention is now being paid to its study. Considerable ecological data have been accumulated during periodic surveys conducted by this laboratory, and these, with rearing studies now in progress and continued field observations, should be of considerable value when and if control measures are instituted.

LITERATURE CITED:

1. Jellison, W. L. The parasitism of lizards by *Ixodes ricinus californicus* (Banks). Jour. Parasit., June, 1934, Vol. XX, No. 4.
2. Parker, R. R., C. B. Philip, G. E. Davis, and R. A. Cooley. Ticks of the United States in relation to disease in man. Jour. Ec. Ent., Mar. 16, 1937, 30 (1):51.

THE LARVA AND PUPA OF *HERCULIA INTERMEDIALIS* WLK. (PYRALIDAE, LEPIDOPTERA)

BY V. G. DETHIER,
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Three specimens of the last instar larva of *Herculia intermedialis* Wlk. were collected in the debris of sawdust, spider silk, etc. accumulated under a loose piece of bark on the trunk of a standing pine (*Pinus rigida* Mill.). These hibernating larvae were taken at Buzzards Bay, Mass., on the nineteenth of April. When disturbed the larvae wriggled backwards and dropped to the ground on a thread of silk. Prior to pupation, which occurred April 21, the caterpillars ate a quantity of bark and rotten wood. Just what their true food is remains to be discovered.

Mature Larva. Head height 1.0 mm.; head width 1.3 mm. Head light brown mottled with dark brown to black as shown in Fig. 2. Head capsule roughly rectangular in appearance. Widest point at level of Adf_2. Indentation of dorsal margin less than one-fourth the width. Adfrontal sutures extending two-thirds the length of the head. Surface smooth except for pigmented areas which show pronounced scale-like elevations as illustrated. Ocelli six. Lens of ocellus VI not well defined. Frontal punctures closer together than to frontal setae; slightly forward of frontal setae. Adf_1 about equidistant from F_1 and Adf_2. Adf_a approximate to Adf_2. Epicranium with usual setae. Three ultra-posterior setae visible. Anterior setae (A_1, A_2, and A_3) nearly in a straight line, forming only a very slight angle. P_1 approximately at same level as L_1. P_a nearer to L_1 than to P_1. A_3 about equidistant from P_1 and L_1. O_1 ventrad of ocellus II; about equidistant from ocellus II and III. O_2 caudad of ocellus I. O_3 postero-ventrad of O_2. O_a approximate to ocellus VI. SO_1 separated from SO_2 and SO_3. Genal puncture (G_a) anterior to G_1.

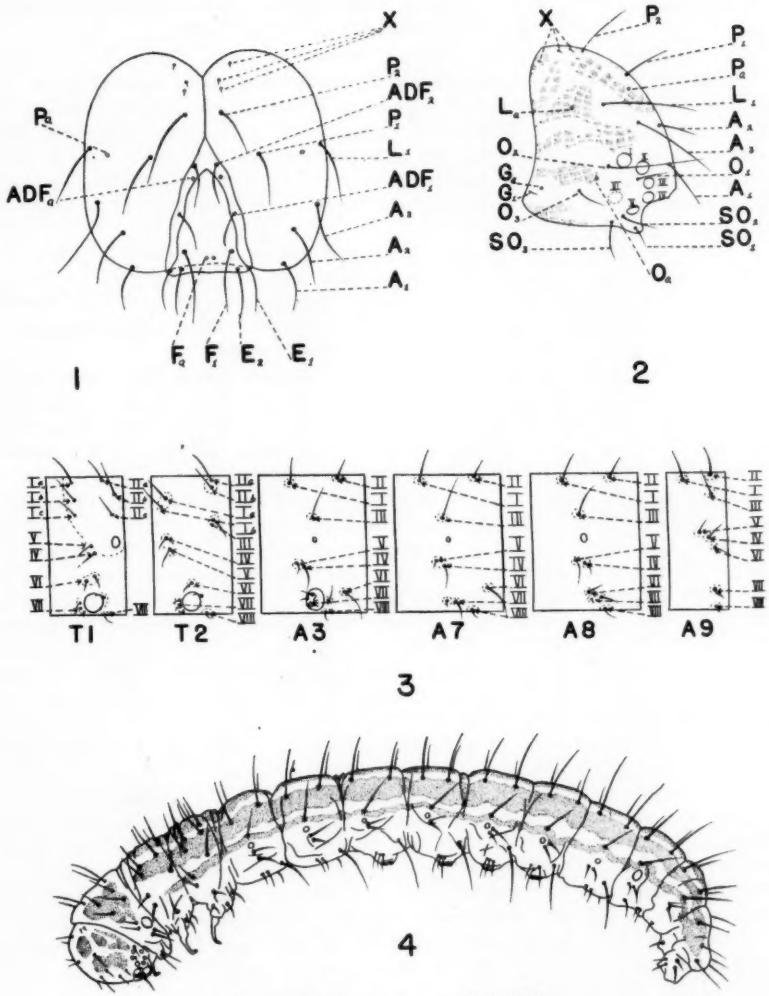
Length of body 14 mm. General color pale sienna. Thin irregular mid-dorsal line pale gray to black, extending from behind the cervical shield to the penultimate segment. A wider irregular para-dorsal band of same color extending to the anal segment. A supra-stigmatal line also gray to black, but narrower, extending to the penultimate segment. Setae moderately long and transparent. No secondary hair. Legs and prolegs normal. Crochets unevenly triordinal, in a circle. Spiracles oval, yellow with black rim. That on eighth abdominal segment same size as prothoracic spiracle, larger than others. Seta III absent on prothorax, and located in supra-stigmatal band on remaining segments; VI bisetose on prothorax, unisetose on other segments; IV and V ventro-cephalad of spiracle; III directly dorsal to spiracle; VII trisetose on abdominal segments 1 to 6, bisetose on abdominal segments 7 and 8, unisetose on abdominal segment 9.

The wide para-dorsal band is bounded dorsally by setae I and II, and its ventral border is a few mm. above seta III. Seta III is at the dorsal border of the supra-stigmatal line. Cervical shield mottled as head.

Pupa. In the debris where it was found, each larva constructed a frail cocoon consisting mainly of minute pieces of rotten wood and bark gathered together by means of a few strands of silk. Pupation occurred April 21 and the adult emerged May 5.

Length of pupa 10 mm. Color light red brown. Slender and tapering. Anterior end rounded. Surface smooth. Wings extending to the middle of the fourth abdominal segment. Labial palpi moderately developed. Maxillae extending nearly full length of the wings. Prothoracic legs extending little more than half the length of the wings. Remaining thoracic legs extending to tips of wings. Genital opening short, almost circular. Anal opening slit-like. Cremaster short and blunt, with five or six recurved hooks.

PLATE I.



Larva of *Herculia intermedialis* Wlk.

Fig. 1. Front view of head of larva (*Herculia intermedialis* Wlk.). A_1, A_2, A_3, anterior setae; ADF_1, ADF_2, ADF_a, adfrontal setae and puncture of epicranium; E_1, E_2, epistomal setae; F_1, F_a, frontal seta and puncture; L_1, lateral seta; P_1, P_2, P_a posterior setae and puncture; X, ultraposterior setae.

Fig. 2. Lateral view of larval head (*H. intermedialis* Wlk.). A_1, A_2, A_3, anterior setae; G_1, G_a, genal seta and puncture; L_1, L_a, lateral seta and puncture; I, II, III, IV, V, VI, ocelli; O_1, O_2, O_3, O_a, ocellar setae and puncture; P_1, P_2, P_a, posterior setae and puncture; SO_1, SO_2, SO_3, subocellar setae; X, ultraposterior setae.

Fig. 3. Setal map of prothoracic, mesothoracic, third, seventh, eighth, and ninth abdominal segments of larva of *H. intermedialis* Wlk.

Fig. 4. Lateral view of last instar larva of *H. intermedialis* Wlk.

NEW DESCRIPTIONS OF LARVAE OF FOREST INSECTS. INTRODUCTION; I. *PANTHEA* (LEPIDOPTERA, PHALAENIDAE) *

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During the past five years several thousand samples of lepidopterous larvae have been collected from spruce in the course of the Canadian Forest Insect Survey (1). It was found that a considerable proportion of the species had been hitherto unknown in the larval stage, and that many others had been only briefly or superficially described. In this paper, and in subsequent instalments, descriptions will be presented for those species whose larvae, to the author's knowledge, have never been described before.

The figures to illustrate the descriptions have been made by Miss M. R. MacKay, to whom the authors wish to express their sincere gratitude. Assistance in rearing these larvae is gratefully acknowledged to Messrs. W. D. Harkness, R. K. Dubreuil and J. J. Fettes. We are indebted to Dr. J. McDunnough and Mr. T. N. Freeman for determination of the reared adults.

Of each species, some fifty to five hundred specimens have been handled in the course of the survey. The descriptions were made from a considerable number of living specimens received during the summer of 1940. In addition, many larvae of each species, preserved in Frehling's solution or by inflation, were used for reference in compiling these descriptions.

The general form of each description closely follows that proposed by Crumb (2). Nomenclature of structures was taken also to conform with that authority. Use was made of a number of characteristics of phalaenid larvae noted by Ripley (8). Chief among these is the epicranial index, being the ratio between the lengths of the frons and the epicranial stem; the latter suture was taken to extend from the vertical triangle to the apex of the frons rather than of the adfrontals (see Fig. 1). Also the comparative median longitudinal widths of the two divisions of the clypeus, the proximal postclypeus and the larger distal preclypeus, is used as a quantitative index. Finally, following that authority, note is made of the relative distance between ocelli 1 and 2 and ocelli 2 and 3. However, in the numbering of the ocelli, the order employed by Crumb and by Fracker (5) has been chosen.

In describing the setigerous tubercles, Fracker's distinction between the setal ring or papilla, and the setal plate or pinnaculum (when swollen, known as chalaza) has been adopted. The system of naming the longitudinal lines of pigment follows for the most part that of Forbes (4). In describing tortricids, considerable assistance was gained from the work of Gibson (6). Observations on the ventral prothoracic gland were made according to the published description of Detwiler (3). In the species studied, the blade of the maxillula appeared to be absent, or not to present the characteristic aspects described by Crumb and by Gilbert (7) for other species.

Panthea acronyctoides Wlk.

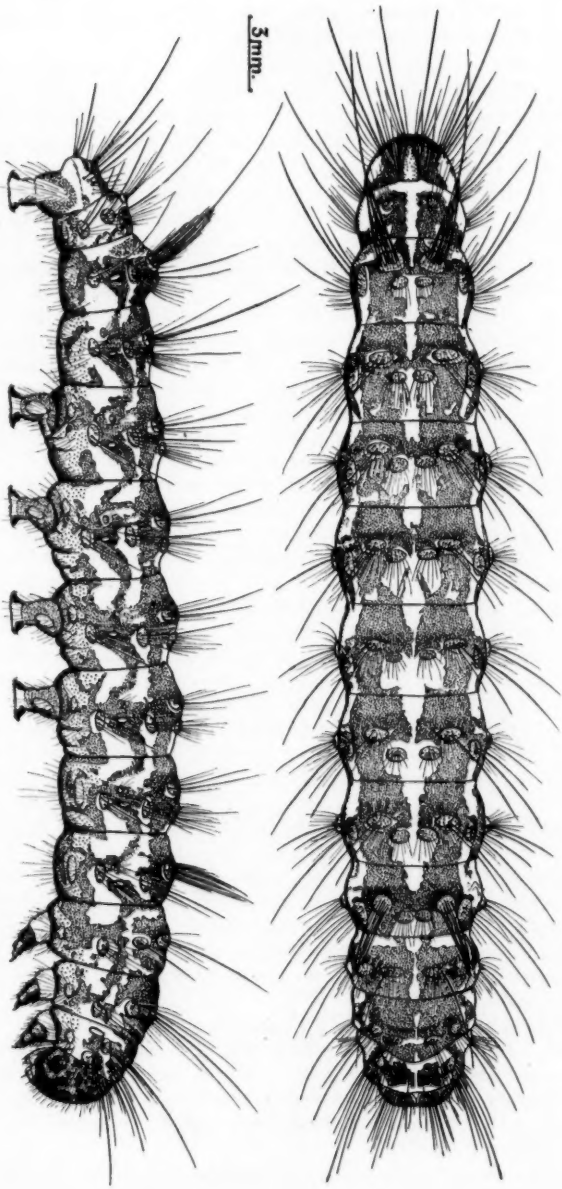
Plate II.

Fourth Instar†. Head width 1.6 to 1.9 mm. Body about 10 mm. long, 2.5 mm. in width; thoracic segments appearing "telescoped" or foreshortened longitudinally. Ground colour dirty white or cream, mottled with dark purplish-brown; the dorsal verrucae ruddy-brown, notably verrucae beta. Dorsal tufts of hairs on 1st and 8th abdominal segments, and on pro- and mesothorax, especially large and black. Head with ground colour cream, heavily mottled with black,

*Contribution No. 2115, from the Division of Entomology, Science Service, Department of Agriculture, Ottawa. This is the first of a series of contributions from the Canadian Forest Insect Survey.

†The number of instars in this species was arbitrarily placed at seven, after the work of Smith and Dyar (Proc. U. S. N. M. 21:1-194) on other Pantheinae.

PLATE II.



LARVA OF *PANTHEA ACRONYCTOIDES* WLK. (ULTIMATE INSTAR).

bearing a conspicuous white cross-shaped marking with its centre immediately above the apex of the frons with two arms extending downwards on either side of the frons, and the other two running dorsad to form the two arms of a "Y" enclosing the epicranial suture, with the white often being continued around the back of head; secondary setae quite dense, stout, and darkly pigmented. Crochets on first abdominal proleg 28.

Fifth Instar. Head width 2.3 to 2.6 mm. Body 16 to 17 mm. long, 2.5 to 2.6 mm. in width. General appearance similar to fourth instar, e.g. ruddy-brown verrucae, large black tufts, and conspicuous white cross-shaped mark on head. Dark mottling of body, however, heavier and lacking a purple tinge.

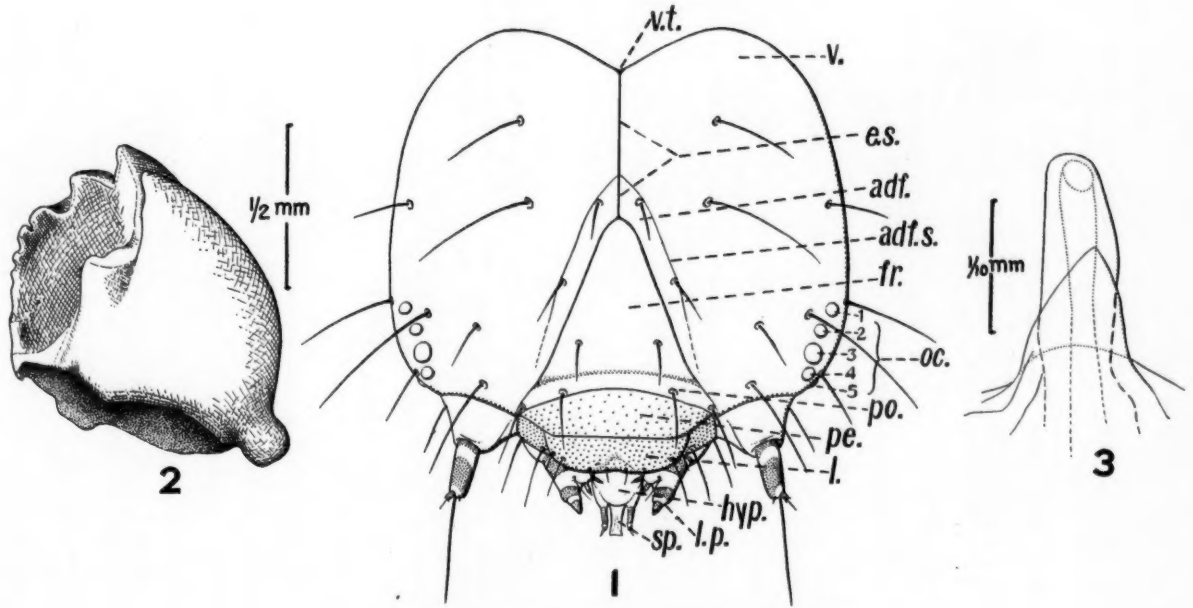
Sixth Instar. Head width 3.1 to 3.3 mm. Body about 23 to 28 mm. long and about 4 mm. in width; shape subcylindrical, tapering posteriorly from the 6th abdominal, and anteriorly from the 1st abdominal segment; ground colour velvety black, the middorsal line white, narrow on thorax and broad on abdomen but narrowing posteriorly, with white patches around the alpha verrucae and in the subdorsal region of each abdominal segment; spiracular line black, bounded above by a white supraspiracular line (broken by the light brown verrucae rho), and paralleled below by a white subspiracular line composed of obliques running forwards and upwards. Venter greyish. Verrucae light brown, bearing tufts of grey hairs, these tufts especially large on the alpha verrucae of the prothorax and abdominal segments 1 and 8, the ventral hairs whitish tinged with fawn. Head as in previous stages, but lightly overlaid with cloudy gray-brown; adfrontals consisting of an irregular area at the apex of the frons and a very narrow shank along the sides of the frons, adfrontal sutures white; epicranial index 0.6; preclypeus translucent cream, its median longitudinal width 6 to 10 times that of postclypeus; labrum brown to black, its cleft shallow, at an angle of 120 degrees, with a light-coloured marking above it; ocellar areas dark brown to black, the distance between ocelli 1 and 2 twice that between ocelli 2 and 3; surface of head with many greyish hair-like secondary setae. Prothoracic shield a small, irregular but definite sclerotized area; anal shield similar. Spiracles elongated elliptical, the centres light brown or orange, with a dark brown to black rim; under each abdominal spiracle is a narrow bracket bearing a group of minute pits. Thoracic legs grey with patches of dark brown sclerotization. Abdominal legs brown, grey or even pinkish-orange, largely covered with verruca of group pi, the lobes longitudinally extended, bearing about 28 crochets. Ventral prothoracic gland present, long and tapering, but apparently seldom seen protruded.

Seventh Instar. Head width 3.5 to 3.8 mm. Body about 34 mm. long and 4 mm. wide; ground colour still cream, but it has become completely overlaid with continuous greyish-brown to velvety-black, except in some cases where the dorsal verrucae and even parts of the dorsal line have remained a light cream colour; the setae have become whitish or yellowish. Head overlaid with a cloudy dark pigmentation, the white cross-shaped mark being in most cases obscured. The white centres of the spiracles are conspicuous. Crochets on first abdominal proleg now number 44.

Mandibles stout, with 6 or 7 blunt teeth, the first two or three large and wedge-shaped, and a large interior tooth (Fig. 2). Hypopharynx with gorge bare and lingua bare anteriorly, the lobes set with slender spines directed towards the gorge. Spinneret slender, cylindrical, about four times as long as broad, with bluntly rounded tip (Fig. 3). Labial palpi with the segments in the proportion of 30:4:25, ranging to 30:7:17.

P. acronyctoides, typically a spruce feeder, may be readily distinguished from *P. furcilla* Pack. which is a pine feeder. While the ground colour of *acronyctoides* is velvety black, with frequent patches of white, that of *furcilla* is brown to brick-red and is unrelieved by any patches of white on the dorsum.

PLATE III.



HEAD STRUCTURES OF PHALAENID LARVAE

Fig. 1. Diagrammatic view of head of *Anomogyna elimata* Gn. (Phalaenidae), to illustrate terms employed. *v.t.*, vertical triangle; *v*, vertex; *e.s.*, epicranial stem; *adf.*, adfrontal sclerites; *adf. s.*, adfrontal sutures; *fr.*, frons; *oc.*, ocelli; *po.*, postclypeus; *pe.*, preclypeus; *l.*, labrum; *hyp.*, hypopharynx; *l.p.*, labial palps; *sp.* spinneret.

Mandible (Fig. 2) and Spinneret (Fig. 3) of *Panthea acronyctoides* Wlk.

The paired hair-pencils on the first and eighth abdominal segments in *furcilla* are much more prominent than the corresponding tufts in *acronyctoides*.

LITERATURE CITED.

1. Brown, A. W. A., 1941. Foliage Insects of Spruce in Canada. Tech. Bull. 31, Dept. Agriculture, Canada.
2. Crumb, S. E., 1929. Tobacco Cutworms. U. S. Dept. Agriculture Tech. Bull. 88.
3. Detwiler, J. D., 1922. Ventral prothoracic gland of some Notodontid Caterpillars. Can. Ent. 54:175-191.
4. Forbes, W. T. M., 1906. Field Tables of Lepidoptera, Worcester, Mass.
5. Fracker, S. B., 1915. The Classification of Lepidopterous Larvae. Ill. Biol. Monographs. Vol. 2, No. 2.
6. Gibson, A., 1925. Observations on the Spruce Budworm. Trans. Roy. Soc. Canada, Section V, 195-205.
7. Gilbert, H. A., 1939. Explorations of the Hypopharynx in Noctuid Larvae. Can. Ent. 71: 231-237.
8. Ripley, L. B., 1923. The External Morphology & Postembryology of Noctuid Larvae. Ill. Biol. Monographs, Vol. 8, No. 4.

Larva of *Panthea acronyctoides* Wlk. (ultimate instar).

NOTES FROM 1940

BY JOS. I. BEAULNE,

Provincial Department of Agriculture, Quebec, Que.

During the year 1940 the following interesting additions were made to the entomological collections of the Plant Protection Service of the Quebec Department of Agriculture. All the localities mentioned are in the Province of Quebec.

Coleoptera

Deleaster dichrous Grav. St. Hilaire, 20-VI-39, Beaulieu; Granby, 8-VI-39, Mercier (det. Ouellet).

Geotrupes stercorarius L. St. Hilaire, 2-VII-39, Cardinal (det. Beaulne).

Narthecius grandiceps Lec. Montreal, 12-VII-35, Beaulne (det. Fisher).

Mycetaea hirta (Marsh). Bred from rotten potatoes, Quebec, 4-III-40, Beaulne (det. Fisher).

Eupogonius subarmatus Lec. Loretteville, 15-VI-40, Auclair (det. Beaulne).

Hypolampsis pilosa Ill. Granby, 10-VIII-40, Mercier (det. Chagnon).

Braconidae

Apanteles autographae Mues. Bred from a sphingid caterpillar, Quebec, 2-VIII-40, Beaulne (det. Muesebeck).

Apanteles griffini Vier. Bred from a sphingid caterpillar, Quebec, 3-VII-40, Beaulne (det. Muesebeck).

Bracon montrealensis Morr. Granby, 16-VI-38, Mercier (det. Townes).

Bracon virginiensis Morr. Granby, 30-VI-38, Mercier (det. Townes).

Macrocentrus amicroploides Vier. Bred from *Ancylis comptana* Froel., Ile d'Orleans, 9-VIII-39, Morriset (det. Muesebeck).

Aphidius polygonaphis Fitch. Quebec, 7-VII-39, Beaulne (deb. Muesebeck).

Lysiphlebus testaceipes Cress. Quebec, 27-VI-39, Beaulne (det. Muesebeck).

Ichneumonidae

Mesoleptus pictus Davis. Quebec, 9-VII-34, Maheux (det. Townes).

Ichneumon popofensis Ash. Quebec, 3-VI-34, Maheux (det. Townes).

Platylabus bakeri Davis. Quebec, 1-VIII-31, Beaulne (det. Townes).

Platylabus signatus Prov. Ile d'Orleans, 21-VIII-39, Morisset (det. Townes).

Perithous divinator Rossi. Quebec, 16-IX-37, Beaulne (det. Townes).

Perithous pleuralis Cress. Quebec, 9-V-39, Beaulne (det. Cushman).

Ichneumon versabilis Cress. Ile d'Orleans, 25-VII-39, Morisset (det. Townes).

Ichneumon cervulus Prov. Ile d'Orleans, 25-VII-39, Morisset (det. Townes).

Amblyteles lachrymans (Prov.) and *rufiventris* (Brulle). Bred from *Vanessa cardui* L., Quebec, 2-VII-40, Beaulne (det. Cushman).

Amblyteles jucundus (Brulle). Bred from *Hydroecia immanis* Gn., St. Martin de Laval, 1-VII-40, Duncan (det. Cushman).

Protarchus magnus Davis. Lac. St. Jean, 20-VII-39, Mercier (det. Townes).

Banchus inermis Prov. Ile d'Orleans, 30-VII-40, Morisset (det. Cushman).

Phygadeuon maturus Prov. Bred from *Cryptorhynchus lapathi* L., Quebec, 4-IX-39, Beaulne (det. Cushman).

Lissonota punctulata (Cress.) Bred from *Cryptorhynchus lapathi* L., Quebec, 6-VIII-40, Beaulne (det. Cushman).

Cynipidae

Amphibolips inanis (O. S.) Bred from oak apple gall on red oak, Quebec, 10-VII-40, Beaulne (det. Weld).

Psammocharidae

Ceropales fraterna Sm. Coaticook, 9-VIII-35, Beaulne (det. Ouellet).

Ceropales bipunctulata Say. Rougemont, 2-IX-35, Mougeot (det. Sandhouse).

Priocnemis conicus (Say). Quebec, 1-V-38; Granby, 6-V-38, Mercier (det. Sandhouse).

Episyron biguttatus (Fabr.) Montreal, 5-VIII-32, Beaulne; Granby, 8-IX-35, Mercier; Ile d'Orleans, 1-VIII-38, Dorval (det. Sandhouse).

Psammochares (*Lophopompilus*) *aethiops* (Cress.) Buckingham, 9-VIII-38, Mercier-Gauthier; Coaticook, 2-VIII-34, Beaulne; Quebec, 16-VIII-38, Beaulne (det. Sandhouse).

Psammochares (*Pompiloides*) *cylindricus* (Cress.) St. Romuald, 22-V-38, Mercier (det. Sandhouse).

Psammochares (*Pompiloides*) *marginatus* (Say). Granby, 2-VIII-38, Mercier; 5-VIII-24 (det. Sandhouse).

Vespidae

Odynerus dilectus Sauss. Trois-Rivieres, 4-VI-38, Mercier (det. Sandhouse).

Odynerus (*Rygchium*) *leucomelas* Sauss. St. Hilaire, 16-VIII-38, Beaulieu; La Pocatiere, 5-IX-37; Lanoraie, 16-VIII-35, Beaulne; Quebec, 27-VIII-37, Dorval (det. Ouellet).

Odynerus pennsylvanicus Sauss. Lanoraie, 13-VIII-35, Beaulne (det. Ouellet).

Odynerus rugosus Sauss. Montreal, 23-VIII-39, Mougeot (det. Ouellet).

Ancistrocerus catskillensis (Sauss.) Ile d'Orleans, 18-VIII-38, Dorval; Lanoraie, 18-VII-35, Beaulne; St. Hilaire, 26-VI-39, Beaulieu; Montreal, 5-VII-32, Beaulne; Lyster, 10-VIII-19, Maheux (det. Ouellet).

Ancistrocerus capra (Sauss.). Granby, 27-VII-37, Mercier; St. Hilaire, Lanoraie, 25-VI-35, Beaulne; Montreal, 11-VII-34, Beaulieu; Quebec, 21-VII-31, Beaulne; La Pocatiere, 29-VII-39, Doyle; Granby, 2-VII-39, Mercier; Coaticook, 15-VI-38, Beaulne (det. Ouellet).

Ancistrocerus tigris (Sauss.). Montreal, 12-VII-30, Beaulne; Lanoraie, 16-VII-35, Beaulne; Ile d'Orleans, 1-VIII-39, Morisset (det. Ouellet).

Ancistrocerus capra (Sauss.). Granby, 27-VII-37, Mercier; St. Hilaire, 23-VI-37, Beaulieu; Maniwaki, 24-VII-17, Roy, Ile d'Orleans, 3-VIII-39, Morisset; Montreal, 16-VI-38, Mougeot; Hemmingford, 13-VI-30, Beaulne; Quebec, 18-VI-38, Beaulne; Buckingham, 9-VIII-37, Mercier and Gauthier (det. Ouellet).

Eumenes fraterna Say. Ile d'Orleans, 25-VII-39, Morisset; La Pocatiere, 10-VIII-39, Doyle; Granby, 5-VIII-39, Mercier; Coaticook, 24-VI-35, Beaulne (det. Ouellet).

Eumenes globulosa Sauss. St. Hilaire, 11-VII-39, Beaulieu; Granby, 29-IX-39, Mercier (det. Sandhouse).

Symmorphus canadensis (Sauss.). St. Hilaire, 28-VI-37, Beaulieu; Ile d'Orleans, 15-VIII-39, Morisset (det. Ouellet).

Sphecidae

Oxybelus quadrinotatus Say. Lanoraie, 18-VII-35, Beaulne (det. Cushman).

Crabro (*Lophocrabro*) *aciculatus* Prov. Abbotsford, 5-VII-35, Beaulne; Quebec, 9-VII-39, Beaulne; Montreal, 1-VII-38, Mougeot (det. Sandhouse).

Bicyrtes ventralis (Say). Lanoraie, 16-VII-35, Beaulne (det. Sandhouse).

Bembex spinolae Lep. Lanoraie, 11-VII-34, Beaulne; Granby, 10-VII-37, Mercier (det. Ouellet).

Gorytes (*Pseudoplisus*) *flavicornis* Pack. Granby, 13-VIII-38, Mercier; Quebec, 18-VII-38, Beaulne (det. Sandhouse).

Gorytes canaliculatus Peck. Quebec, 18-VII-38, Beaulne (det Ouellet).

Gorytes ephippiatus Peck. Granby, 9-VII-39, Mercier; Ile d'Orleans, 25-VII-39, Morisset; Quebec, 18-VII-38, Beaulne (det. Ouellet).

Philanthus solivagus Say. Rougemont, 2-IX-35, Mougeot; Levis, 8-VII-37, Dorval (det. Sandhouse).

Cerceris deserta Say. Ile d'Orleans, 25-VI-38, Morisset (det. Ouellet).

Cerceris clypeata Dahl. Lanoraie, 1-VII-34, Beaulne; Quebec, 16-VI-38, Beaulne; Granby, 5-VIII-39, Mercier; Ile d'Orleans, 14-VII-39, Morisset (det. Ouellet).

Cerceris nigrescens Sm. Rougemont, 23-VIII-35, Mougeot; Lanoraie, 18-VII-35, Beaulne (det. Ouellet).

Solenius sayi Ckll. Quebec, 18-VI-38, Beaulne; Lanoraie, 6-VIII-34, Beaulne; Coaticook, 29-VI-36, Beaulne (det. Ouellet).

Blepharipus cinctipes (Prov.). Quebec, 15-V-39, Beaulne (det. Cushman).

Hylaeidae

Hylaeus ziziae (Robt.). Lanoraie, 16-VII-35, Beaulne (det. Krombein).

Andrenidae

Andrena hirticincta Prov. Ile d'Orleans, 17-VIII-38, Morisset (det. Crawford).

Andrena pruni Robt. Granby, 27-VI-38, Mercier (det. Krombein).

Halictidae

Halictus coriaceus Sm. Montreal, 11-VIII-34, Beaulne (det. Sandhouse).

Halictus lerouxii Lep. St. Hilaire, 22-VII-38, Beaulieu (det. Crawford).

Proteraner ranunculi Robt. Granby, 24-V-40, Mercier (det. Krombein).

Agapostemon virescens (Fabr.) Granby, 20-VI-40, Mercier (det. Krombein).

Sphecodes arvensis Patt. Lanoraie, 18-VII-35, Beaulne (det. Krombein).

Augochlora pura (Say). Quebec, 3-VII-40, Beaulne (det. Krombein).

Megachilidae

Coelioxys rufitarsis Sm. La Pocatiere, 15-VII-38, Doyle (det. Krombein).

Megachile latimanus Say. Lanoraie, 13-VII-35, Beaulne; Quebec, 9-VII-34, Maheux (det. Crawford).

Osmia atriventris Cress. Granby, 20-VII-40, Mercier; Montreal, 7-VII-39, Mougeot (det. Krombein).

ON A COLLECTION OF MYRIOPODS FROM IOWA.

BY RALPH V. CHAMBERLIN,
University of Utah, Salt Lake City, Utah.

The following notes pertain to a small but interesting collection of centipeds and millipeds made by Dr. D. T. Jones in central Iowa during the spring of 1941.

CHILOPODA

Otocryptops sexspinosus (Say). One specimen of this widespread species taken at Ames.

Arenophilus bipuncticeps (Wood). Four specimens taken at Ames in the spring and three at "The Ledges", six miles south of Boone on May 19.

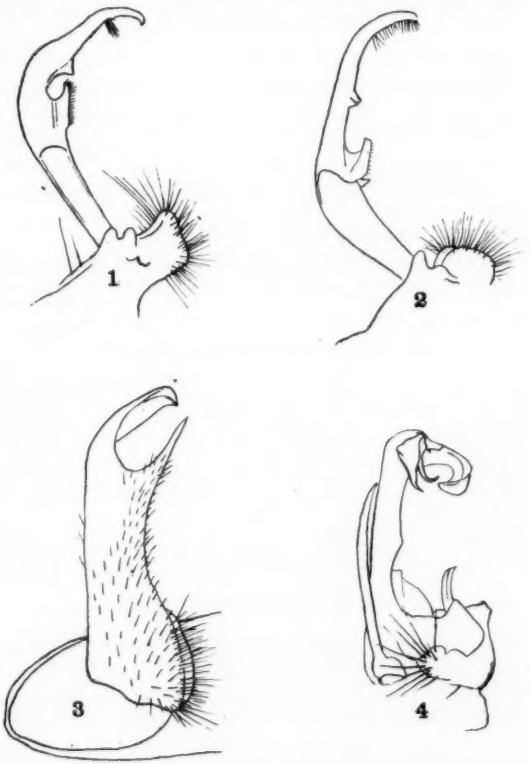


Fig. 1. *Polydesmus scopus*, n. sp. Right gonopod of male, ectal view.
Fig. 2. *Polydesmus planicolens*, n. sp. Right gonopod of male, ectal view.
Fig. 3. *Zinaria iowa*, n. sp. Right gonopod of male, sub-ventral view.
Fig. 4. *Spirostrephon jonesi*, n. sp. Left gonopod of male, caudal aspect.

Geophilus rubens Say. Two typical specimens showing the usual geminate dorsal stripe were taken at Ames in the spring.

Neolithobius suprenans Chamberlin. Three specimens taken in the spring at Ames.

Nadabius iowensis (Meinert). One male of this common mid-western species was taken April 26 at Indianola and several males and females at Ames "in the spring."

Pokabius bilabiatus (Wood). One small and somewhat aberrant male was taken at Indianola on April 26.

DIPLOPODA

Oriulus medianus Chamberlin. A number of specimens, males, females and young, taken at Ames.

Hakiulus parallelus Chamberlin. One male taken at Ames. It conforms with Texas specimens.

Spirobolus sp. Several young specimens of uncertain species were taken at "The Ledges", 6 miles south of Boone on May 19.

Scytonotus granulatus (Say). Three specimens taken at Indianola, April 26, and several males and females at Ames during the spring.

Polydesmus scopus n. sp.

Color dark brown with keels lighter. Legs and antennae brown.

Second, third and fourth keels with two lateral serrations in addition to the one at anterior corner. Fifth keels with three serrations back of the one at corner, and thereafter serration similar on the poriferous keels, the intervening ones with 2.

Characterized by the form of the gonopods of male, which are of the same general type as in *P. serratus*. See figure.

Length, about 21 mm.; width, 3.4 mm.

Locality. Iowa: The Ledges, 6 miles south of Boone. One male taken May 19, 1941; also a female probably this species taken 3 miles west of Boone on the same date.

Polydesmus planicolens n. sp.

A smaller form than *P. scopus*, with lateral serrations of keels smaller, less sharply defined. The gonopods resemble those of *P. serratus*, but the subapical tooth of telopodite is missing and the basal process is shorter and separated by a wider gap from the median one which is different in being bifid. There is a conical tooth at base of lower process toward mesal side. See accompanying figure.

Length, 17 mm.; width, 3 mm.

Locality. Iowa: Ames. One male taken in the spring of 1941.

Eurymerodesmus booneus n. sp.

Dorsum in general color nearly black with keels and a transversely elongate median spot brick red, the apical portion of caudal process of keels, however, darkened. Antennae and legs pale yellow.

Posterior angles of keels produced in increasing degree from sixth segment caudad.

Length, about 13 mm.; width, 3 mm.

Locality. Iowa: 3 miles west of Boone. Two females taken May 19, 1941.

A small form suggesting *E. melacis* of Texas, but somewhat smaller, having a width of 3 mm. as against 3.5 mm. in the female. The caudal processes of the keels begin earlier, on the fifth as against the twelfth segment. A conspicuous difference is in having a separated median brick red spot on each segment instead of a band entirely crossing the dorsum to the red of the keels.

Zinaria iowa n. sp.

General color of dorsum nearly black, with keels a bright yellow and a band across caudal border of metazonite a dull yellow, this transverse band widest at middle. Legs yellow, antennae light brown.

Distinguished by the form of the male gonopods for which see the figure. Length, 23 mm.; width, 5.2 mm.

Locality. Iowa: Ames. One male taken in the spring of 1941 by Dr. D. T. Jones.

A much smaller form than *Z. urbana* of Illinois and larger than *Z. cala* of Florida. Distinct from both in details of gonopods.

Spirostrephon jonesi n. sp.

In general structure and appearance much like *S. lactarium*. The outer limb at distal end of the male gonopods is narrowed at the tip instead of blunt as in *lactarium*, but broader, and more clavate than in *texense;* the mesal branch is slender and simple, not bifid as in *texense;* while the mesal process is simple, not bifid as in *lactarium*, and much longer than in *texense*. See further the accompanying figure.

Diameter, 1.8 mm.

Locality. Iowa: Ames. One male taken in the spring of 1941 by D. T. Jones.

A SYNOPSIS OF THE GENUS *ANONCIA*, WITH ONE NEW SPECIES (COSMOPTERYGIDAE; LEPIDOPTERA)

BY J. F. GATES CLARKE,

Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

In my paper on the North American Oecophoridae* I transferred seven species from this family to the Cosmopterygidae and erected the new genus *Anoncia* for them. Since the completion of that paper I have had an opportunity to study *Borkhausenia longa* Meyrick and *B. leucoritis* Meyrick†. These also belong in *Anoncia* and are hereby transferred to that genus. In addition, one new species has come to hand and is described below. This brings to ten the total number of known species from North America referable to *Anoncia*.

The species of this genus, except *diveni*, from Brownsville, Tex., are known only from the far Western States. The distribution, although imperfectly known because of the paucity of material, is as follows: *longa*, Arizona and Utah; *mentzelia*, Washington; *leucoritis*, Alpine, Texas; *fasciata, marinensis, episcia, sphacelina, conia,* and *orites*, California; *diveni*, Brownsville, Tex.

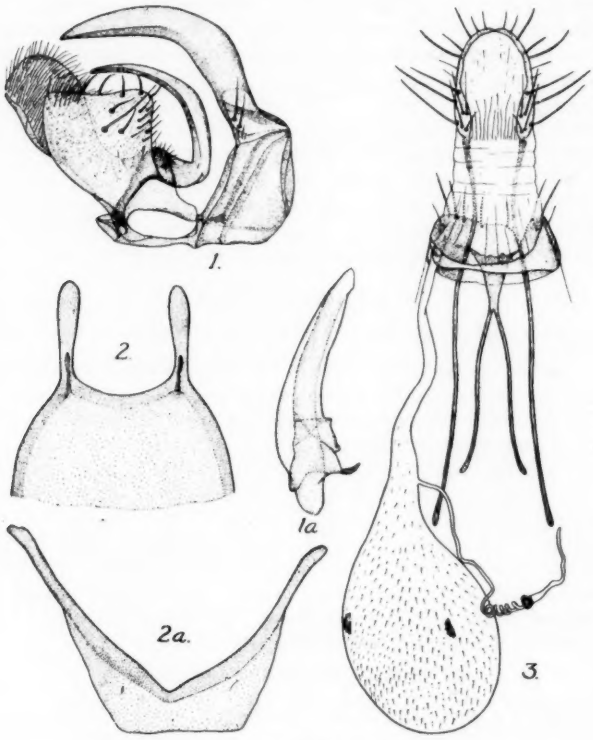
KEY TO THE SPECIES OF *ANONCIA*

1. Forewing with a pronounced transverse fascia 2
   Forewing without transverse fascia 3
2. Fascia at basal third; brownish fuscous ..... *fasciata* (Walsingham).
   Fascia at middle; blackish brown ..... *diveni* (Heinrich).
3. Forewing white or whitish, with few maculations 4
   Forewing otherwise 6
4. Forewing tinged with ochreous; alar expanse 24-28 mm. ..... *longa* (Meyrick).
   Forewing otherwise; alar expanse much less 5
5. Markings of forewing blackish fuscous; tornal spot well defined ..... *mentzeliae*, new species
   Markings of forewing fuscous; tornal spot hardly indicated or absent ..... *leucoritis* (Meyrick)
6. Forewing with a more or less well defined light, longitudinal area in the cell 7
   Forewing without such area in the cell 8

*Proc. U. S. Nat. Mus., vol. 90, pp. 33-286, 1941.

†Meyrick, E., Exotic Microlepidoptera, vol. 3, p. 381, 1927.

7. Basal area of forewing lighter than the general ground color *sphacelina* (Keifer).
   Basal area of forewing not lighter than the general ground color *marinensis* (Keifer).
8. Labial palpus with apex of second segment white 9
   Labial palpus with apex of second segment cinereous ..... *episcia* (Walsingham)
9. Forewing uniformly gray or with faint markings ..... *conia* (Walsingham).
   Forewing strongly mottled ..... *orites* (Walsingham).



Anoncia mentzeliae n. sp.

1—1a. 1. Lateral view of male genitalia with aedeagus removed; 1a, lateral aspect of aedeagus.
2—2a. Eighth segment of male abdomen. 2, 8th tergite; 2a, 8th sternite.
3. Ventral view of female genitalia.

Anoncia mentzeliae n. sp.

Plate 1, Figures 1-1a, 2-2a, 3

Antenna, except scape, fuscous overlaid with white above; scape white with a sprinkling of blackish- fuscous scales.

Labial palpus, head, thorax, forewing, and abdomen white. Second segment of labial palpus irrorated with blackish fuscous on the outside. Forewing with a small blackish-fuscous spot in the middle of the cell and another, similar spot at the end of the cell. The latter is frequently confluent with a larger spot of the same color on the inner margin, slightly before tornus; around the termen

and apex is an irregular series of blackish-fuscous irrorations. In some specimens these are obsolete. Legs irrorated and suffused, and tarsi broadly annulated, with blackish fuscous. Hind wing light fuscous, somewhat lighter basally than apically; cilia white.

Male genitalia. Asymmetrical; harpe subtriangular; cucullus truncate, fleshy; right harpe with long, strong, falciform basal process. Vinculum reduced to a narrow band. Aedeagus moderately stout, slightly curved. Gnathos a long, curved, strongly sclerotized hook.

Female genitalia. Asymmetrical; ostium opening on left side. Genital plate reduced and narrowed ventrally. Anterior apophyses fused, arising dorsally. Bursa copulatrix oval with numerous fine spicules from the inner surface; signa two small, dentate plates; ductus bursae membranous with inception of ductus seminalis from anterior end.

Alar expanse 16–20 mm.

Type. United States National Museum No. 55727.

Type locality. Snake River, Whitman County, Wash., opposite Clarkston (15-VIII-40, J. F. Gates Clarke).

Food plant. Mentzelia laevicaulis (Dougl.) T. and G.

Remarks. Described from the type male and seven male and eight female paratypes as follows: Six males and seven females from the type locality; one male and one female, Walla Walla, Wash. (27-VI-1935, H. P. Lanchester).

The paratypes will be distributed as follows: One male and one female will be deposited in the Los Angeles Museum, Los Angeles, Calif., one male in the State College of Washington Collection, Pullman, Wash., and the remainder in the United States National Museum.

The genitalia place this species nearest to *Anoncia leucoritis* (Meyrick), from which it differs by the longer and heavier process from the base of the right harpe, and stronger gnathos. The third segment of the labial palpus of *mentzeliae* is shorter than that of *leucoritis* and the markings of the forewing are darker and more pronounced.

The larva of *mentzeliae* feeds in the immature ovaries of the food plant. Pupation occurs in a loosely constructed cocoon within the ovary. Evidence of of the work of this species was found at several localities in Washington State. There is little doubt that *mentzeliae* will be found elsewhere in the intermountain area following the range of the food plant.

The drawings for this paper were made by Mrs. Mary Foley Benson.

NOTES

THE RASPBERRY ROOT-BORER IN SASKATCHEWAN

In the spring of 1941, the attention of the writer was drawn to larvae boring in the roots of raspberries at Prince Albert, Sask. Infested roots from which the dead canes had been removed were kept in a container in a humid atmosphere, and adult aegeriid moths emerged in July. Their identity as *Bembecia marginata* (Harris) has been kindly verified by Dr. J. H. McDunnough.

This is the first record of the pest in Saskatchewan where it was probably introduced with stock brought from the east some years ago. With a two year cycle, several years would be required to build up a population to pest proportions. Since the winter is passed in the roots underground, the low temperatures of the west can have little effect, and there is every likelihood that the borer will spread and become established in this province.

L. G. Saunders,
Saskatoon, Sask.

A COLLECTION OF ANOPHELINE MOSQUITOES FROM SOUTHERN ONTARIO

Recently one of the writers (E. H. H.) had the opportunity to collect anopheline mosquitoes near Cayuga, Ontario (Haldimand County, 43° N. Lat.). On August 25, 1940, a considerable number of adult mosquitoes were collected from the inside of screened windows and a screened door in the basement of a farm house. In addition, a number were obtained resting in the outdoor approach to the cellar. Unusually low temperature (approaching freezing) on August 22 and 23 may have been responsible for the concentration of the adults in these particular places. On September 2, the mosquitoes were still abundant in the same situations. Adult male and female *Anopheles quadrimaculatus* Say and *A. punctipennis* Say were present.

The residence, from which these collections were made, is situated about one-fourth of a mile from the Grand River at a point about five miles down stream from Cayuga. Owing to heavy rains the Grand River had flooded over its banks and water of several inches in depth was spread out in the flood plain into terrestrial vegetation. A large quantity of flotage (debris) was present on the water surface. In one such area abundant anopheline breeding was encountered. Each dip averaged more than one larva. Subsequent identification indicated that *Anopheles quadrimaculatus, A. punctipennis* and *A. walkeri* Theob. larvae were present.

The writers have been unable to find any published records of *Anopheles quadrimaculatus* from Canada,* although the species has been reported from similar latitudes in the United States. It is difficult to interpret the role that this species might play in transmission of malaria in such areas. Certainly in this isolated instance the species had reached a surprising density. Altogether 40 female and 8 males were captured. The type of breeding habitat, where the larvae were found, was characteristic of its preferred breeding places in the southern United States.

On August 14, 1935, several *Anopheles quadrimaculatus* females were taken from this residence, but positive indentification was impossible since no males were found.

The writers are glad to acknowledge the kindness of Dr. W. V. King in confirming the identification of the larvae and the male hypopygia.

E. Harold Hinman and H. S. Hurlbut,

Tennessee Valley Authority, Wilson Dam, Alabama.

*Dr. Robert Matheson has informed the writers that he has a record of one male *Anopheles quadrimaculatus* from St. Catherines, Ontario. Mr. C. R. Twinn has informed us that this species has been recorded from St. Catharines and Jordan, Ontario, by Dyar (1921, Trans. Royal Can. Institute, XIII, 120), from Quebec and Montreal, Quebec, by Fisk (1931, Can. Med. Assoc. Jour., XXV, 7), and from Vernon, Oliver, and Nicola Lake, British Columbia, by Hearle (1927, Proc. Ent. Soc. B. C., No. 36, 17). The Canadian National Collection contains a male from Trenton, Ontario (det. Hearle), in addition to females from most of the localities cited above.

GUELPH PRINTING SERVICE

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